

REMARKS

Upon entry of the Amendment, Claims 9-36 will be pending in the application. Claims 1-8 were previously canceled.

Claims 9, 15, 21 and 27 are amended for clarification to recite “said solder being lead-free” and to recite a range of “silver at X weight % wherein X is equal to or greater than 0.001, but smaller than 0.1”. New Claims 33-36 are added. Support may be found, for example, at Example 1 at pages 13-14. No new matter is added.

Entry of the Amendment along with reconsideration and review of the claims on the merits are respectfully requested.

Formal Matters

Applicants appreciate the Examiner’s indication that the drawings filed on August 31, 2005, are accepted by the Examiner. Applicants also appreciate the Examiner’s acknowledgement of Applicants’ claim for foreign priority and receipt of copies of the certified copies of the priority documents in this National Stage application from the International Bureau. Applicants also appreciate the Examiner’s consideration of the IDS filed on December 3, 2004.

Response to Objection to Specification

The disclosure is objected to because of the following informalities: The specification contains geometric symbols on page 18 lines 6, 7 and 10 and page 24 lines 5, 6, 10 and 11 that are not clear as to what the symbols are intended to represent, and presumed to be typographical errors.

In response Applicants submit that the geometric symbols identified in the specification are identical to the geometric symbols identified in Figures 7 and 11A-11B. The geometric symbols allow the reader to understand the Figures more clearly and are thus appropriate in the specification for that purpose. The geometric symbols are not typographical errors.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the objection to the specification.

Response to Claim Rejections - 35 U.S.C. §102

A. Claims 9, 15, 21 and 27 are rejected under 35 U.S.C. §102(b) as assertedly being anticipated by Murata et al. (JPN 09-94687 A, IDS).

The Examiner cites Murata as teaching an electronic component formed by soldering with a solder comprising 7 to 10% Zn, up to 6% Bi and 0.1% Ag in a balance of Sn.

B. Claims 9-11, 13-17, 19-23, 25-29, 31 and 32 are rejected under 35 U.S.C. §102(b) as assertedly being anticipated by Kawashima et al. (USPN 5,690,890).

The Examiner cites Kawashima as teaching an electronic component soldered to a board by soldering with a solder comprising up to 10% Zn, at least 0.1 % Bi and 0.1 % Ag in a balance of Sn.

Applicants respond as follows.

Claims 9, 15, 21 and 27 are amended for clarification to recite “said solder being lead-free” and to recite a range of “silver at X weight % wherein X is equal to or greater than 0.001, but smaller than 0.1”. As explained in detail in the specification at page 13, lines 2-9 and at page

22, the bottom line to page 23, line 4, if solder contains silver at 0.1 wt % or greater, no advantages can be obtained. Hence, it is preferable for the lead-free solder in accordance with the present invention to contain silver at X wt % where X is equal to or greater than 0.001, but smaller than 0.1.

Murata fails to anticipate the present invention. Murata appears to disclose a silver (Ag) content of 0.1 to 3.5 wt % (see Abstract). Thus, Murata fails to anticipate at least the range of “silver at X weight % wherein X is equal to or greater than 0.001, but smaller than 0.1”.

Kawashima also fails to anticipate the present invention. Kawashima relates to a lead-containing solder as Kawashima requires that “the lead content of the solder is not less than 15 wt. %, preferably not less than 30 wt. %, of the total weight of the solder.” (see column 2, lines 10-12). Further, Kawashima discloses a silver (Ag) content of 0.1 to 5 wt % (see Abstract). Thus, Kawashima fails to anticipate the present invention as claimed.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the anticipation rejections.

Response to Claim Rejection - 35 U.S.C. §103

Claims 12, 18, 24 and 30 are rejected under 35 U.S.C. §103(a) as assertedly being unpatentable over Kawashima et al. (USPN 5,690,890) in view of Yamaguchi et al. (US 2001/0025875 A1).

The Examiner recognizes that Kawashima fails to disclose a narrower powder size range.

However, the Examiner cites Yamashita as teaching a Sn-Zn-Bi-Ag solder (Table 1)

powder mixed with flux wherein the powder size falls within the range of 30 to 40 microns (paragraph 30), and asserts that it would have been obvious to one of ordinary skill in the art to employ a narrow powder size range (within 10 micrometers) to control paste properties such as thixotropy and sag resistance.

Applicants respond as follows.

As previously noted, Claims 9, 15, 21 and 27 are amended for clarification to recite “said solder being lead-free” and to recite a range of “silver at X weight % wherein X is equal to or greater than 0.001, but smaller than 0.1”.

As Kawashima requires a certain amount of lead content in its solder, a skilled artisan would not be motivated to combine Kawashima with Yamaguchi. Further, Yamaguchi’s examples in Table 1 fail to satisfy the elemental compositions and weight % ranges of the present invention. Thus, the combination of Kawashima with Yamaguchi is not motivated and would therefore fail to render obvious the present invention requiring a lead-free solder.

Even if the combination of Kawashima and Yamaguchi were motivated, which could not be the case, the combination would still fail to render obvious the claimed invention. As Kawashima teaches the criticality of a certain amount of lead content in its solder, any combination of Kawashima with Yamaguchi must include Kawashima’s lead. Also, Yamaguchi fails to make up for Kawashima’s deficiencies as Yamaguchi discloses a silver (Ag) content of 2.0 to 3.5 wt %. Thus, the combination of Kawashima with Yamaguchi would fail to render obvious the present invention requiring at least a lead-free solder and silver content of “silver at X weight % wherein X is equal to or greater than 0.001, but smaller than 0.1”.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No.: 10/516,708

Atty. Docket No. Q85154

Accordingly, Applicants respectfully request reconsideration and withdrawal of the obviousness rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

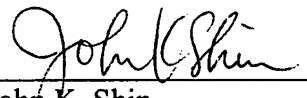
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